CLAIMS

1. Apparatus for frequency content separating an input signal, said apparatus comprising:

a plurality of frequency separating stages, each frequency separating stage including at least one complex frequency shifting converter operable to receive a complex input signal representing an input bandwidth extending from –Fs/2 to +Fs/2 and to output a first frequency shifted complex output signal representing an upper portion of said input bandwidth and a second frequency shifted complex output signal representing a lower portion of said input bandwidth, wherein

at least one complex frequency shifting converter in at least one of said plurality of frequency separating stages is a tuned complex frequency shifting converter having a frequency shifting characteristic operable to output a frequency shifted complex output signal representing a portion of said input bandwidth centred other than at –Fs/4 or +Fs/4.

2. Apparatus as claimed in claim 1, wherein said tuned complex frequency shifting converter has a frequency shifting characteristic operable to output a frequency shifted complex output signal representing a portion of said input bandwidth having an output bandwidth between Fs/2 and 3Fs/4.

3. Apparatus as claimed in any one of claims 1 and 2, wherein said plurality of frequency separating stages are operable to generate a plurality of output signals each bearing one or more target carrier signals, said plurality of output signals respectively representing portions of said input bandwidth which at least one of:

differ in size; and

are non-contiguous.

4. Apparatus as claimed in any one of claims 1, 2 and 3, wherein between frequency separating stages frequency shifted complex output signals are decimated and interleaved for subsequent processing.

5. Apparatus as claimed in any one of the preceding claims, wherein said tuned frequency shifting complex converter includes a local oscillator operable to generate one or more time varying coefficient signals by which sample values forming said input signal are multiplied as part of frequency separation.

6. Apparatus as claimed in claim 5, wherein said local oscillator is operable to generate a selectable one of a plurality of different streams of time varying coefficient signals each corresponding to a different local oscillator frequency and operable to separate a different portion of said input bandwidth.

7. Apparatus as claimed in any one of the preceding claims, wherein said tuned frequency shifting complex converter is one of:

a tuned complex up-converter; and

a tuned complex down-converter.

8. Apparatus as claimed in any one of the preceding claims, wherein one or more of said plurality of frequency separating stages includes a complex up-converter and a complex down-converter pair that together are operable to separate a complex input signal into an upper frequency portion and a lower frequency portion being substantially contiguous and of equal size.

9. Apparatus as claimed in claim 3, wherein said plurality of output signals are passed through respective fine tuning stages that serve to extract said target carrier signals.

10. A method selecting operating characteristics of a plurality of frequency separating stages within an apparatus as claimed in any one of claims 1 to 9, said method comprising the steps of:

determining whether two target signals require extracting from any final frequency separating stage, and if so providing two fine tuning elements for those final frequency separating stages;

determining a number of frequency separating stages required to separate all target signals;

generating local oscillator coefficient values for each frequency separating stage;

generating fine-tuning local oscillator coefficient values for any fine tuning elements within final frequency separating stages; and

selecting a band shaping filter to be applied to each target signal.